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热能工程

定功率下喷水减温对机组热经济性影响的数学模型

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摘要： 喷水减温系统是火电厂热力系统的重要组成部分，影响机组的热经济性。该文基于热力系统矩阵热平衡方程，根据减温水的来源不同，分别建立了在定功率条件下过热器喷水减温和再热器喷水减温对机组热经济性影响的数学模型。利用微分理论，得出主蒸汽流量同减温水流量间的依变关系。以某600 MW机组为例，分别计算过热器喷水减温和再热器喷水减温在不同减温水来源的情况下对机组热经济性的影响。结果表明，减温水来自最高压加热器出口时对机组热经济性的影响最小。

关键词： 喷水减温 热经济性 矩阵法 热耗变换系数

Mathematical Model for the Influence of Spray Desuperheating on Thermal Economy Under Conditions of Constant Power Output

LIU Qiang

Abstract: Spray desuperheating system is an important component of thermodynamic system in thermal power plant, which impacts the thermal economy of a unit. Based on the thermal balance matrix equation for thermodynamic system and different sources of spray desuperheating water, mathematical models for the influence of spray desuperheating on thermal economy under conditions of constant power output were derived. The relation between main steam flow and spray desuperheating water flow was derived by using differential theory. The influences of superheater spray desuperheating and reheater spray desuperheating on thermal economy of a 600MW unit were calculated. The results indicate that the spray desuperheating has the least influence on thermal economy when the spray desuperheating water is from the outlet of the highest pressure heater.

Keywords: spray desuperheating thermal economy matrix method heat rate transformation coefficient

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